would expect, almost half of the reports are concerned with photosynthesis, and they cover such aspects as the process itself, the pigments, the photosynthetic apparatus, and methodology. Another major group involves research based on synchronous cultures, while a third series considers various aspects of metabolism other than photosynthesis. In addition, of course, there are some individual papers that stand isolated from these major subject areas.

This volume is a testimonial not only to Hiroshi Tamiya but also to the role that microalgae and photosynthetic bacteria now play as experimental organisms in the investigation of a variety of biochemical and physiological problems. Among Tamiya's contributions to making them important was his demonstration, in 1953, that the growth of *Chlorella* could be synchronized. Since then, the principle of synchronous culturing has become a powerful tool in elucidating the life cycle of unicellular organisms at the physiological and biochemical level. The book is a fitting tribute to Tamiya, and it is essential reading for investigators in many different areas of research.

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Tissue Culture

The Cultivation of Animal and Plant Cells. Philip R. White. Ronald, New York, ed. 2, 1963. viii + 228 pp. Illus. $9.

Methods of tissue culture are used to study an ever-widening range of biological problems. Yet few courses in the principles and methods of tissue culture are given at the university level, and the novice must learn either by apprenticeship or from a text. White's book is one of a half dozen available textbooks, and a new edition, published 9 years after the first, is most welcome. Although the second edition contains no more pages than the first, changes in the format have allowed the author to use at least 50 percent more words.

This book is the result of an individual's effort, not the product of team work. It reflects White's special authority in the areas where botanical and zoological aspects of tissue culture overlap. The opening chapter gives historical perspective and carries over from the first edition a photographic gallery of outstanding investigators, several of whom are still very active. The next several chapters consider fundamentals: sources of plant and animal tissues suitable for cultivation; designing and equipping a laboratory; nutrients; and basic techniques. These chapters are brought up-to-date and include, for example, recently developed methods for the culture of insect tissues. White maintains a nice balance between "how to do it" information and conceptual issues, such as the definition of nutritional requirements in terms of a particular objective (survival, growth, specialized function). A new chapter deals with methods of establishing clones of mammalian and plant cells. Unfortunately, efforts to establish a large population of identical cells are usually thwarted by somatic mutations and perhaps other changes. Another chapter deals with the vexing problems of measurement. Better nondestructive analytical methods are needed to avoid the statistical averaging of data on groups of nonidentical cultures. The final chapter briefly surveys some of the results obtained with tissue culture.

There are two appendixes in which the author describes basic expriments that are designed for use in the classroom and the long term preservation and storage of cell cultures by freezing methods. A useful bibliography follows. The index contains only one reference to DNA, a refreshing if anomalous state of affairs in 1963 for a 200-page work on cell biology.

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New Books

Mathematics, Physical Sciences, and Engineering

Advances in Electronics and Electron Physics. suppl. 1, *Electroluminescence and Related Effects.* Henry F. Ivey. Academic Press, New York, 1963. 288 pp. Illus. $11.

Advances in Physical Organic Chemistry. vol. 1. V. Gold, Ed. Academic Press, New York, 1963. 458 pp. Illus. $13.

Analytical Chemistry. Proceedings of the international symposium (Birmingham University, England), April 1962. Philip W. West, A. M. G. Macdonald, and T. S. West, Eds. Elsevier, New York, 1963. 423 pp. Illus. $16.

Basic Mathematics for General Education. Harold C. Trimble, E. W. Hamilton, and Ina Mae Silvey. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1963. 343 pp. Illus. $8.

Combinatorial Mathematics. Herbert John Ryser. Published for the Mathematical Assoc. of America. Wiley, New York, 1963. 168 pp. Illus. $4.

Digital Computer Engineering. Harry J. Gray. Prentice-Hall, Englewood Cliffs, N.J., 1963. 399 pp. Illus. $16.

Digital Processing. A system orientation. Louise Schultz. Prentice-Hall, Englewood Cliffs, N.J., 1963. 415 pp. Illus. $11.90.

Elementary Chemical Thermodynamics. Bruce H. Mahan. Benjamin, New York, 1963. 167 pp. Illus. Paper, $1.95; cloth, $3.95.

Erosion and Sedimentation. Henri Termier and Geneviève Termier. Translated and edited by D. W. Humphries and Evelyn E. Humphries. Van Nostrand, Princeton, N.J., 1963. 445 pp. Illus.

How Chemical Reactions Occur. An introduction to chemical kinetics and reaction mechanisms. Edward L. King. Benjamin, New York, 1963. 159 pp. Illus. Paper, $1.95; cloth, $3.95.

On the Interaction Between Atomic Nuclei and Electrons. H. B. G. Casimir. Freeman, San Francisco, 1963 (© 1939, Haarlem, Netherlands). 108 pp. Illus. Paper, $2.

An Introduction to Polymer Chemistry. W. R. Moore. Aldine, Chicago, 1963. 270 pp. Illus. $7.50.

Introductory College Mathematics. Adele Leonhardy. Wiley, New York, ed. 2, 1963. 494 pp. Illus. $7.50.

Microelectronics. Theory, design, and fabrication. Edward Keonjian, Ed. McGraw-Hill, New York, 1963. 402 pp. Illus. $12.50.

Modern Physics. The quantum physics of atoms, solids, and nuclei. Robert L. Sproull. Wiley, New York, ed. 2, 1963. 644 pp. Illus. $9.75.

The Modern Structural Theory of Organic Chemistry. Lloyd N. Ferguson. Prentice-Hall, Englewood Cliffs, N.J., 1963. 608 pp. Illus. $17.55.

Nouveau Traité de Chimie Minérale. vol. 20, pt. 2, *Alliages Métalliques.* Paul Pascal, Ed. Masson, Paris, 1963. 1104 pp. Illus. Paper, F. 200; cloth, F. 212.

Organic Syntheses. Collective vol. 4 (a revised edition of annual volumes 30–39). Norman Rabjohn, Ed. Wiley, New York, 1963. 1050 pp. Illus. $16.50.

The Physics of Experimental Method. H. J. J. Braddick. Reinhold, New York, ed. 2, 1963. 503 pp. Illus. $12.

Principles of Chemistry. R. T. Sanderson. Wiley, New York, 1963. 636 pp. Illus. $7.95.

The Quantum Theory of Molecular Electronic Structure. Robert G. Parr *et al.* Benjamin, New York, 1963. 525 pp. Illus. Paper, $6.95; cloth, $10.

Rocket Propulsion Elements. An introduction to the engineering of rockets. George P. Sutton. Wiley, New York, ed. 3, 1963. 471 pp. Illus. $10.50.

Rutherford at Manchester. J. B. Birks, Ed. Benjamin, New York, 1963. 374 pp. Illus. $12.50.

The Shape of Carbon Compounds. An introduction to organic chemistry. Werner Herz. Benjamin, New York, 1963. 165 pp. Illus. Paper, $1.95; cloth, $3.95.